

PTO/SB/08A

OCT 21 2002

**SUPPLEMENTAL INFORMATION  
DISCLOSURE  
STATEMENT BY APPLICANT**

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**Complete if Known**

Application Number	10/054,629
Filing Date	January 22, 2002
Confirmation Number	5778
First Named Inventor	Chang Bum Kim, et al.
Group Art Unit	1765 1775
Examiner Name	S. STEIN

Sheet 1 of 1 Attorney Docket No. MEMC 01-0151 (2960.1)

**U.S. PATENT DOCUMENTS**

Examiner Initials*	Cite No. <sup>1</sup>	U.S. Patent Document		Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY
		Number	Kind Code <sup>2</sup> (if known)		

**FOREIGN PATENT DOCUMENTS**

Examiner Initials*	Cite No. <sup>1</sup>	Foreign Patent Document			Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	T <sup>6</sup>
		Office	Number <sup>4</sup>	Kind Code <sup>2</sup> (if known)			
SSS	145	JP	11043396		Ohashi Wataru, et al.	02-16-1999	A

**OTHER ART - NON PATENT LITERATURE DOCUMENTS**

Examiner Initials*	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.) date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>6</sup>
SJS	146	International Search Report, PCT/US 02/01782 dated September 20, 2002	

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Examiner Signature	<i>Steph Shum</i>	Date Considered	3/7/2004
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Sheet

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of

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Application Number	10,054,629
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Examiner Name	Unknown STEIN
Attorney Docket No.	MEMC 01-0151(2960.1)

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		Number	Kind Code <sup>2</sup> (if known)		
SJS	1	3,997,368		Petroff et al.	12/14/1976
SJS	2	4,314,595		Yamamoto et al.	02/09/1982
SJS	3	4,350,560		Helgeland et al.	09/21/1982
SJS	4	4,981,549		Yamashita et al.	01/01/1991
SJS	5	5,264,189		Yamashita et al.	11/23/1993
SJS	6	5,316,742		Tomioka et al.	05/31/1994
SJS	7	5,441,014		Tomioka et al.	08/15/1995
SJS	8	5,474,020		Bell et al.	12/12/1995
SJS	9	5,485,803		Habu, R.	01/23/1996
SJS	10	5,487,354		von Ammon et al.	01/30/1996
SJS	11	5,494,849		Iyer et al.	02/27/1996
SJS	12	5,502,010		Nadahara, S. et al.	03/26/1996
SJS	13	5,567,399		von Ammon et al.	10/22/1996
SJS	14	5,593,494		Falster	01/14/1997
SJS	15	5,667,584		Takano et al.	09/16/1997

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First Named Inventor	Chang Bum Kim				
Group Art Unit	1705 1775				
Examiner Name	Unknown STEIN				
Sheet	2	of	11	Attorney Docket No.	MEMC 01-0151(2960.1)

SJS	16	5,704,973	Sakurada et al.	01/06/1998
SJS	17	5,728,211	Takano et al.	03/17/1998
SJS	18	5,789,309	Hellwig	08/04/1998
SJS	19	5,846,322	Schulmann et al.	12/08/1998
SJS	20	5,919,302	Falster et al.	07/06/1999
SJS	21	5,935,320	Graef et al.	08/10/1999
SJS	22	5,942,032	Kim et al.	08/24/1999
SJS	23	5,954,873	Hourai et al.	09/21/1999
SJS	24	5,958,133	Boulaev et al.	09/28/1999
SJS	25	5,968,262	Saishouji et al.	10/19/1999
SJS	26	5,968,264	Iida et al.	10/19/1999
SJS	27	5,994,761	Falster et al.	11/30/1999
SJS	28	6,045,610	Park et al.	04/04/2000
SJS	29	6,048,395	Iida et al.	04/11/2000
SJS	30	6,053,974	Luter et al.	04/25/2000
SJS	31	6,066,366	Berenbaum et al.	05/23/2000
SJS	32	6,093,913	Schrenker et al.	07/25/2000
SJS	33	6,120,599	Iida et al.	09/19/2000
SJS	34	6,153,008	von Ammon et al.	11/28/2000
SJS	35	6,197,111	Ferry et al.	03/06/2001

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Signature*Stan Stein*Date  
Considered

3/7/2004

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Examiner Name	Unknown STEIN

Sheet 3 of 11 Attorney Docket No. MEMC 01-0151(2960.1)

SJS	36	6,228,164		von Ammon et al.	05/08/2001
SJS	37	6,236,104		Falster	05/22/2001
SJS	38	6,245,430		Hourai et al.	06/12/2001
SJS	39	6,254,672		Falster et al.	07/03/2001
SJS	40	6,312,516		Falster et al.	11/06/2001
SJS	41	6,336,968		Falster et al.	01/08/2002

## FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No. <sup>1</sup>	Foreign Patent Document			Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	T <sup>6</sup>
		Office	Number <sup>4</sup>	Kind Code <sup>2</sup> (if known)			
SJS	42	EP	0 503 816	B1	Shin-Etsu Handotai Company Ltd.	09/16/1992	
SJS	43	EP	0 504 837	A2	Shin-Etsu Handotai Company Ltd.	09/23/1992	
SJS	44	EP	0 536 958	A1	Shin-Etsu Handotai Company Ltd.	04/14/1993	
SJS	45	EP	0 909 840		Shinetsu Handota KK	04/21/1999	
SJS	46	EP	0 962 556	A1	Shin-Etsu Handotai Company Ltd.	12/08/1999	
SJS	47	EP	0 962 557	A1	Shin-Etsu Handotai Company Ltd.	12/08/1999	
SJS	48	EP	0 990 718		Sumitomo Metal Ind. Ltd.	05/14/2000	
SJS	49	JP	1145391 (abstract only)		Yamashita Ichiro, et al.	06/07/1989	

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Group Art Unit	1765 1775
Examiner Name	Unknown STEIN

Sheet	4	of	11	Attorney Docket No.	MEMC 01-0151(2960.1)
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SJS	50	JP	2-180789		Kawasaki Steel Corp.	07/13/1990	X
SJS	51	JP	2-267195		Nippon Steel Corp.	10/31/1990	X
SJS	52	JP	Hei 3-93700 (abstract only)		Nippon Steel Corp.	04/18/1991	
SJS	53	JP	4-042893		Nippon Steel Corp.	02/13/1992	X
SJS	54	JP	4-108682 (abstract only)		Fuji Electric Co., Ltd.	04/09/1992	
SJS	55	JP	2528309	B2	Seito Ito, et al.	08/28/1996	X
SJS	56	JP	8-330316 (Pub. Hei 07-158458)		Sumitomo Sitix Corp.	12/13/1996	X
SJS	57	JP	HO 8-268794		Sumitomo Sitix Corp.	10/15/1996	X
SJS	58	JP	HO 9-202690 (abstract only)		Shin-Etsu Semiconductor K.K.	08/05/1997	
SJS	59	JP	11-157995	A	Sumitomo Sitix Corp.	06/15/1999	X
SJS	60	JP	11-180800	A	Shin-Etsu Handotai Company Ltd.	07/06/1999	X
SJS	61	JP	11-189495	A	Sumitomo Metal Ind. Ltd.	07/13/1999	X
SJS	62	JP	11-199386	A	Shin-Etsu Handotai Company Ltd.	07/27/1999	X
SJS	63	JP	11-199387	A	Shin-Etsu Handotai Company Ltd.	07/27/1999	X
SJS	64	PCT	WO 97/26393 (abstract only)		Shin-Etsu Handotai Co., Ltd.	07/24/1997	
SJS	65	PCT	WO 98/45507		MEMC Electronic Materials Inc.	10/15/1998	
SJS	66	PCT	WO 98/45508		MEMC Electronic Materials Inc.	10/15/1998	

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Sheet	5	of	11	Attorney Docket No.	MEMC 01-0151(2960.1)

SJS	67	PCT	WO 98/45510		MEMC Electronic Materials Inc.	10/15/1998	
SJS	68	PCT	WO 00/14776		MEMC Electronic Materials Inc.	03/16/2000	
SJS	69	PCT	WO 00/22196		MEMC Electronic Materials Inc.	04/20/2000	
SJS	70	PCT	WO 00/22198		MEMC Electronic Materials	04/20/2000	
SJS	71	PCT	WO 01/21861	A1	MEMC Electronic Materials	03/29/2001	
SJS	72	PCT	WO 01/21865	A1	MEMC Electronic Materials	03/29/2001	
SJS	73	UK	GB 2 137 524	A	Hitachi Ltd. (Japan)	10/10/1984	
SJS	74	UK	GB 2 182 262	A	Sony Corp.	05/13/1987	

## OTHER ART - NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.) date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>2</sup>
SJS	75	ABE, T., et al., "Swirl Defects in Float-Zoned Silicon Crystals," Physics., Vol. 116B, (1985), pp. 139-147	
SJS	76	ABE, T., et al., "The Characteristics of Nitrogen in Silicon Crystals," VLSI Science and Technology/1985, (Electrochem. Soc. Pennington, 1985), Proceedings Vol. 85-5, (1985), pp. 543-551	
SJS	77	ABE, T., et al., "Behavior of Point Defects in FZ Silicon Crystals," Semiconductor Silicon 1990, Proceedings of the Sixth International Symposium on Silicon Materials Science and Technology, Vol. 90-7 (1990), pp. 105-116	
SJS	78	ABE, T., et al., "Dynamic Behavior of Intrinsic Point Defects in FZ and CZ Silicon Crystals," Mat. Res. Soc. Symp. Proc., Vol. 262, (1992), pp. 3-13	
SJS	79	ABE, T., "The Formation Mechanism of Grown-In Defects in CZ Silicon Crystals Based on Thermal Gradients Measured by Thermocouples Near Growth Interfaces," Materials Science Engineering, Vol. B73, (2000), pp. 16-29	

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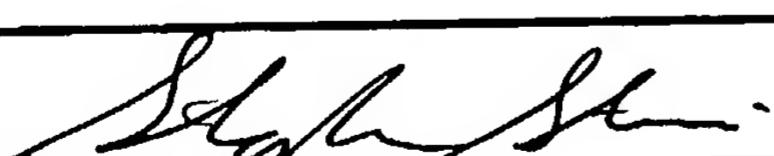
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Sheet	6	of	11	Attorney Docket No.	MEMC 01-0151(2960.1)
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SJS	80	BORIONETTI, G., et al., "Investigation of Low Denisty Defects in Czochralski Silicon Crystals: Their Detectability, Formation Kinetics and Influence on Gate Oxide Intergrity," Electrochemical Society Proceedings, Vol. 96-13, pp. 160-169
SJS	81	DE KOCK, A.J.R., "Microdefects in Swirl-Free Silicon Crystals," pp. 83-94 (source unknown) (date unknown)
SJS	82	DE KOCK, A.J.R., "The Elimination of Vacancy-Cluster Formation in Dislocation -Free Silicon Crystals," J. of the Electrochem. Soc.: SOLID-STATE SCIENCE AND TECHNOLOGY, Vol. 118, No. 11, (Nov. 1971), pp.1851-1856
SJS	83	DE KOCK, A.J.R., et al., "Effect of Growth Parameters on Formation and Elimination of Vacancy Clusters in Dislocation-Free Silicon Crystals," Journal of Crystal Growth, Vol. 22 (1974), pp. 311-320
SJS	84	DE KOCK, A.J.R., "Point Defect Condensation in Dislocation-Free Silicon Crystals", Semiconductor Silicon, 1977, pp. 508-520.
SJS	85	DE KOCK, A.J.R., et al., "The Effect of Doping on the Formation of Swirl Defects in Dislocation-Free Czochralski-Grown Silicon Crystals," Journal of Crystal Growth, Vol. 49, (1980) pp. 718-734
SJS	86	DORNBURGER, E., et al., "The Impact of Dwell Time Above 900°C During Crystal Growth on the Gate Oxide Integrity of Silicon Wafers," Electrochemical Society Proceedings, Vol. 96, No. 13, pp. 140-151
SJS	87	DORNBURGER, E., et al., "The Dependence of Ring Like Distributed Stacking Faults on the Axial Temperature Gradient of Growing Czochralski Silicon Crystals," Electrochemical Society Proceedings, Volume 95-4, (5/1995) pp. 294-305
SJS	88	DORNBURGER, E., et al., "Simulation of Grown-In Voids in Czochralski Silicon Crystals," Electrochemical Society Proceedings, Vol. 97-22, pp. 40-49
SJS	89	DORNBURGER, E., et al., "Simulation of Non-Uniform Grown-In Void Distributions in Czochralski Silicon Crystals," Electrochemical Society Proceedings, Vol. 98, Vol. 1, pp. 490-503
SJS	90	DORNBURGER, E., et al., "Defects in As-Grown Silicon and Their Evolution During Heat Treatments," Materials Science Forum, 1997, Vols. 258-263, pp. 341-346.

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Sheet	7	of	11	Attorney Docket No.	MEMC 01-0151(2960.1)

SJS	91	EIDENZON, A.M., et al., "Classification of Grown-In Microdefects in Czochralski-Grown Silicon Crystals," Inorganic Materials, Vol. 31(4), 1994, pp. 401-409
SJS	92	EIDENZON, A.M., et al., "Defect-Free Silicon Crystals Grown By The Czochralski Technique," Inorganic Materials, Vol. 33, No. 3, (1997) pp. 219-225.
SJS	93	EIDENZON, A.M., et al., "Influence Of Growth Rate On Swirl Defects In Large Dislocation-Free Crystals Of Silicon Grown By The Czochralski Method," Sov. Phys. Crystallogr.; Vol. 30 , No. 5 (1985) pp. 576-580.
SJS	94	FASLTER, R., et al., "Intrinsic Point-Defects and Reactions in the Growth of Large Silicon Crystals," Electrochemical Society Proceedings, Vol. 98-1, pp. 468-489
SJS	95	FALSTER, R., et al., "Intrinsic Point Defects and Their Control in Silicon Crystal Growth and Wafer Processing," Vol. 25(6) , (2000), pp. 28-32
SJS	96	FALSTER, R., et al., "On the Properties of the Intrinsic Point Defects in Silicon: A Perspective from Crystal Growth and Wafer Processing," Vol. 222(1), (2000), pp. 219-244
SJS	97	FOLL, H., et al. "The Formation of Swirl Defects in Silicon by Agglomeration of Self-Interstitials," Journal of Crystal Growth, 1977, pp. 90-1087, Vol. 40, North-Holland Publishing Company
SJS	98	HARADA, H., et al., "Oxygen Precipitation Enhanced with Vacancies in Silicon, pp. 76-85
SJS	99	HOURAI, M., et al., "Nature and Generation of Grown-In Defects in Czochralski Silicon Crystals," Electrochemical Society Proceedings, Vol, 98-1, pp. 453-467
SJS	100	HOURAI, M., et al., "Improvement of Gate Oxide Integrity Characteristics of CZ-Grown Silicon Crystals," Progress in Semiconductor Fabrication presented by: Semiconductor Equipment and Materials International, Semicon/Europa 93, March 30-April 1, 1993, Geneva, Switzerland
SJS	101	HOURAI, M., et al. "Growth Parameters Determining the Type of Grown-In Defects in Czockralski Silicon Crystals," Materials Science Forum, Vols. 196-201 (1995) pp. 1713-1718
SJS	102	HOURAI, M., et al., "Formation Behavior of Infrared Light Scattering Defects in Silicon During Czochralski Crystal Growth," J. Electrochem. Soc., Vol. 142(9), (1995), 3193-3201

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Application Number	10,054,629
Filing Date	January 22, 2002
Confirmation Number	5778
First Named Inventor	Chang Bum Kim
Group Art Unit	1765 1775
Examiner Name	Unknown

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SJS	103	KISSINGER, G., et al. "A Method for Studying the Grown-In Defect Density Spectra in Czochralski Silicon Wafers," Journal of Electrochemical Society, Vol. 144, No. 4, (1997) pp. 1447-1456	
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Examiner Name	Unknown

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SJS	115	PUZANOV, N.I., et al., "The Role of Intrinsic Point Defects in the Formation of Oxygen Precipitation Centers in Dislocation-Free Silicon," Crystallography Reports, Vol. 41, No. 1, (1996), pp. 134-141	
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Sheet	10	of	11	Attorney Docket No.	MEMC 01-0151(2960.1)
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SJS	128	TAN, T. Y., "Point Defects, Diffusion Processes, and Swirl Defect Formation in Silicon," Appl. Phys. A., Vol. 37, (1985) pp. 1-17
SJS	129	VANHELLEMONT, J., et al., "Defects in As-Grown Silicon and Their Evolution During Heat Treatments," Materials Science Forum, Vols. 258-263, (1997) pp. 341-346
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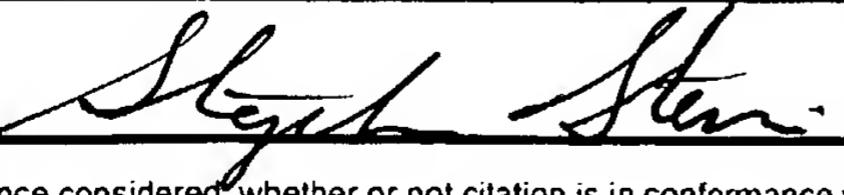
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SJS	140	WINKLER, R., et al. "Improvement of the Gate Oxide Integrity by Modifying Crystal Pulling and Its Impact on Device Failures" Journal of the Electrochemical Society, Vol. 141, No. 5 (5/1994) pp. 1398-1401.	
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